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**TWO NEW SPECIES OF STREPSIPTERA FROM THAILAND
(Notulae Strepsipterologicae-V)***

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Abstract

Two new species of Strepsiptera, *Triozocera siamensis* and *Myrmecolax chantaneeae*, are described based on the male specimens collected at light in San Pa Tong, northern Thailand. This is the first record of the two genera from Thailand. Keys to the world known species of *Triozocera* and *Myrmecolax* are provided.

The material on which the present paper is based was collected in the San Pa Tong Rice Experiment Station located about 30 km south-west of Chiang Mai at light by Mrs. Chantanee Hengsawad, an entomologist working for the station on the population dynamics of the rice hoppers and *Elenchus yasumatsui* Kifune et Hirashima, which is a stylopid parasitic on the white-backed planthopper and the brown planthopper in northern part of Thailand (Kifune and Hirashima, 1975; Yasumatsu et al., 1975). The material was picked up by Hirashima from her collection of *Elenchus yasumatsui* while he was visiting the station in 1977 in order to conduct the project "Field studies on the biological control of leafhoppers and planthoppers (Hemiptera : Homoptera) injurious to rice plants in South-East Asia", which was granted by the Ministry of Education, Science and Culture, Tokyo. Thus, this paper is a byproduct of the project.

It is interesting to report here the occurrence of *Triozocera* and *Myrmecolax* from Thailand. Although the species of these genera are not associated with

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the rice hoppers, Mrs. Chantanee's collection of Strepsiptera is evaluated from a viewpoint of systematics.

It may be noteworthy to mention that the positive phototactic behavior in Strepsiptera seems to be rather dominant in the primitive groups such as the corioxenid and myrmecolacid species.

CORIOXENIDAE

Triozocera siamensis, new species

Male. (Figs. 1-7)

Size. Total length of body 2.1-2.3 mm ; length of head and thorax together 1.3-1.35 mm ; head breadth, 0.52-0.54 mm ; metathoracic sclerites more or less deformed in mounting medium so that no measurement is made; length of aedeagus, 0.39-0.42 mm.

Structure. Typical form of the genus. Head elliptical, broader than long; eyes hemispherical, about 10 facets visible from above ; antennae 7-segmented, first segment triangular, second segment globular, each flabellum of third and

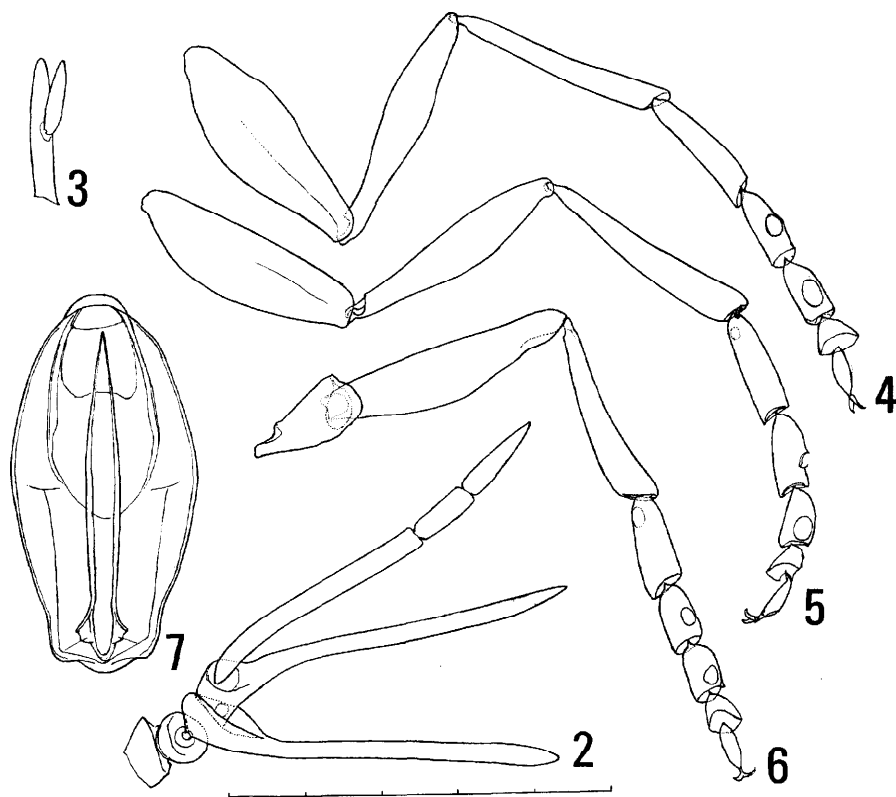


Fig. 1. *Triozocera siamensis*, new species, holotype male dorsal view. Scale : 1 mm.

fourth segments long, with blunt tips, fifth segment long, cylindrical, slightly broadened toward the distal end, about one and a half times as long as sixth and seventh segments together, seventh segment longer than sixth, flabellum of third segment reaching base of seventh and that of fourth reaching at least basal third of seventh; maxilla Z-segmented, tip of terminal segment fusiform, not surpassing the tip of lanceolate basal segment.

Prothorax half as broad as head; mesothorax a little broader and longer than prot horax ; metathorax as broad as head; anterior margin of prescutum semicircularly convex, external sides of both scuti almost parallel; scutellum equilaterally triangular ; postlumbium spindle-shaped, transversely elongated, medianly constricted ; postscutellum subtriangular, tapering backward, almost as long as prescutum and scutellum together.

Abdomen 10-segmented, elliptical in general shape ; terminalia elliptical on anterior portion, rectangular on posterior portion ; tenth tergite quadrilateral: aedeagus broadest at basal third and evenly tapering to the tip without any sinuation or constriction.



Figs. 2-7. *Triozocera siamensis*, new species, male. 2: Right antenna. 3: Right maxillary palpus. 4: Right foreleg. 5: Right midleg. 6: Right hindleg. 7: Terminalia. One scale: 0.1 mm.

Hindwing with typical venation ; detached vein to radius short, costa and subcosta reaching midpoint of anterior margin; media, cubitus, and second vannal vein ending more or less apart from wing margin.

Legs slender, of typical form; tarsi 5-segmented, clawed.

Female and triungulin. Unknown.

Hcst. Unknown.

TYPE MATERIAL: Holotype male (Type No. 2153, Kyushu Univ.), July 23, 1977, and 2 paratopotype males, July 23 and September 17, 1977, collected at light in the San Pa Tong Rice Experiment Station, San Pa Tong, Thailand, by Chantane Hengsawad. Originally mounted in slides.

TYPE DEPOSITORY: The holotype male and 1 paratopotype male are preserved in the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka. Another paratopotype male is deposited in the collection of the San Pa Tong Rice Experiment Station.

Specimens examined other than the type material: 1 male in the same series but not in a good condition. This is also returned to Mrs. Chantane.

REMARKS: The present new species resembles *T. boharti* Luna de Carvalho, 1967, from Philippines, but differs from it by the metathorax (especially the scutellum) broad and the aedeagus almost evenly tapering.

Since Pierce (1909) erected the monotypic genus *Triozocera* (originally spelled as *Trioxocera* and lately emended by himself) based on *T. mexicana*, the following 13 species including the present new species, which are listed in the key below, have been described from various parts of the world. Two of them, *texana* Pierce, 1911 from U. S. A. and *paulistana* Kogan, 1958 from Brazil, were treated as synonym of *mexicana* by Bohart (1941) and Kinzelbach (1971), respectively. Agreed to Luna de Carvalho (1967), however, we treat *texana* and *paulistana* are good species. A key to the world known species of *Triozocera* is given below.

KEY TO THE WORLD SPECIES (MALES) OF *Triozocera*

1. Scutellum clearly longer than broad (measured on posterior margin) 2
- Scutellum equilaterally triangular, as long as broad 6
2. Postscutellum at most one-third as broad as long (measured across mid-point) ;
aedeagus not constricted, not sinuate in dorsal view; length of body 1.75 mm.
Liberia and ? Nigeria* *T. maxi* Pox et Pox, 1964
- Postscutellum about one-half as broad as long 3
3. Aedeagus tapering evenly to the tip, neither constricted nor sinuate in dorsal
view 4
- Aedeagus lightly constricted or sinuate in dorsal view 5
4. Posterior margin of 10th tergite emarginate in middle ; length of body 2.7 mm.

* Luna de Carvalho (1972) recorded *T. maxi* from Nigeria. It seems probable that his species is *T. dundoana* so far as is judged from his figures, especially the shapes of maxilla, 10th tergite and aedeagus.

- Mexico **T. tecpanensis** Brailovsky et Márquez, 1974
- Posterior margin of 10th tergite not emarginate ; length of body 3 mm. Brazil
..... **T. paulistana** Kogan, 1958
5. Aedeagus lightly constricted, the terminal sixth filamentous; length of body
3 mm. Angola **T. africana** Luna de Carvalho, 1956
- Aedeagus lightly sinuate in dorsal view, the terminal third tapering to a point,
proximal two-thirds nearly parallel-sided ; length of body 1.6 mm. Mexico
..... **T. mexicana** Pierce, 1909
6. Postscutellum nearly as long as broad; aedeagus strongly constricted near
the tip, the terminal sixth arrow-head-like; length of body 4 mm. Angola ...
..... **T. gigantea** Luna de Carvalho, 1956
- Postscutellum longer than broad 7
7. Detached vein to radius almost inconspicuous; length of body 1.7 mm. Philip-
pines **T. boharti** Luna de Carvalho, 1967
- Detached vein to radius conspicuous 8
8. Aedeagus not constricted, not sinuate in dorsal view 9
- Aedeagus lightly sinuate or conspicuously constricted near the tip in dorsal
view 11
9. Aedeagus broadest at the median portion; tip of distal segment of maxilla
not exceeding the prolonged tip of basal segment; length of body 2.1-2.4 mm.
Thailand **T. siamensis**, new species
- Aedeagus broadest at the basal portion 10
10. Second vannal vein almost reaching wing margin ; detached vein to media not
parallel to it; length of body 2.25 mm. U. S. A. and Cuba **T. texana** Pierce, 1911
- Second vannal vein ending more or less apart from wing margin; detached
vein to media parallel to it; length of body 1.8 mm. New Guinea
..... **T. papuana** Kogan et Oliveira, 1964
11. Aedeagus lightly sinuate in dorsal view, evenly tapering to the tip; length of
body 3 mm. Japan (Host: *Macroscytus japonensis* Scott (Cydnidae))
..... **T. macroscyti** Esaki et Miyamoto, 1958
- Aedeagus conspicuously constricted near the tip in dorsal view 12
12. Epicranial plates approaching posteriorly to each other; jugal vein not so
conspicuous ; length of body 2.4 mm. Angola and Nigeria (?)*
..... **T. dundoana** Luna de Carvalho, 1956
- Epicranial plates gradually separated posteriorly to each other; jugal vein
conspicuous ; length of body 2.8 mm. Ghana **T. endrodyi** Luna de Carvalho, 1973

MYRMECOLACIDAE

***Myrmecolax chantaneae*, new species**

Male. (Figs. 8-15)

Size: Total length of body, 2.44-2.55 mm ; length of head and thorax together 1.52-1.72 mm; head breadth 0.8-0.85 mm; metathoracic sclerites more or less deformed in mounting medium so that no measurement is made; length of aedeagus 0.18-0.21 mm.

Structure: Typical form of the genus. Head transverse, about twice as broad as long, frontal area anteriorly protruded to form an antennal base-

* See the footnote on p. 64.

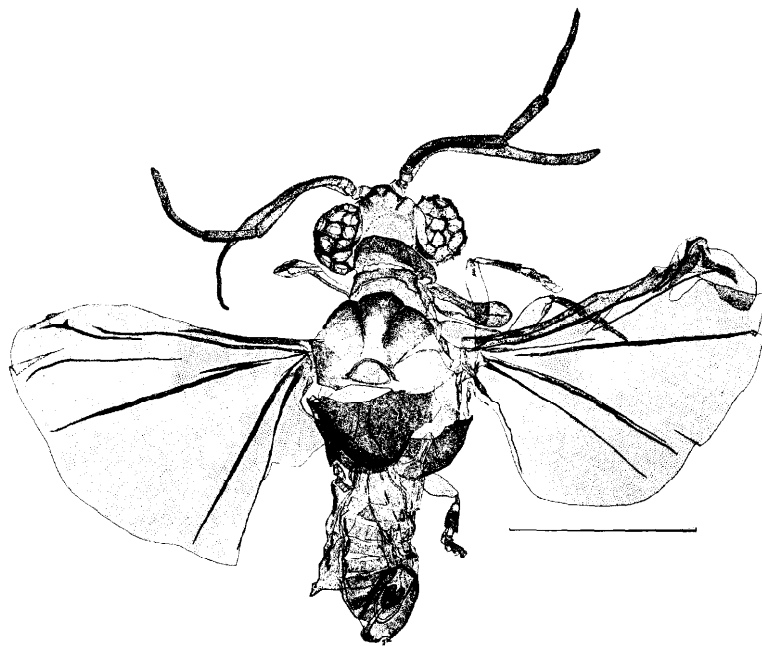
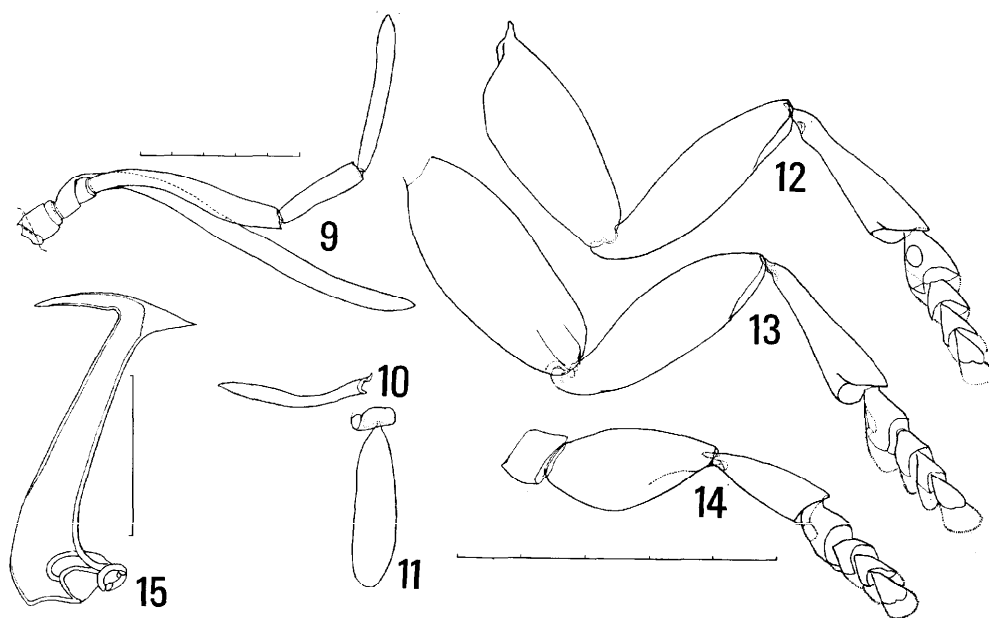


Fig. 8. *Myrmecolax chantaneeae*, new species, holotype male, dorsal view. Scale: 1 mm.

ment, triangle in form; eyes spherical, about 10 facets visible from above; antennae 7-segmented, first segment cylindrical, as long as broad, second segment very short, half as long as first, third segment cylindrical with long and flat flabellum almost reaching middle of terminal seventh segment, fourth segment short, as large as second, fifth segment very long, cylindrical, slightly broadened toward the proximal tip, sixth segment about three-fifths as long as seventh, both being flattened; mandibles lanceolate with pointed tip, broadest at proximal third; maxilla Z-segmented, basal segment rectangular, terminal segment cudgel-form, with rounded tip, about four times as long as broad.

Prothorax about two-thirds as long as and less than half as broad as head; mesothorax almost equal to or slightly narrower than prothorax; metathorax, if not deformed in mounting medium, probably a little narrower than head; anterior margin of prescutum roundly convex, clearly beyond the anterior margins of both scuti; scuti rhomboid, grooves between prescutum and both scuti conspicuous, slightly curved antero-interiorly; scutellum semicircular, narrower than postlumbium; postlumbium membranous, fusiform; post-scutellum almost as broad as long, almost as long as prescutum, posterior tip not surpassing the posterior margins of epimera.

Abdomen elliptical or cylindrical in appearance; terminalia ovoid, posterior half broader than anterior half; tenth tergite cordiform; aedeagus evenly



Figs. 9-15. *Myrmecolax chantaneeae*, new species, male. 9: Right antenna. 10: Right mandible. 11: Right maxillary palpus. 12: Right foreleg. 13: Right midleg. 14: Right hindleg. 15: Aedeagus (right lateral view). One scale: 0.1 mm. Fig. 10-14: with same scale.

tapering to apex, dorsal process prominent, sharply pointed; ventral projection slightly curved.

Hindwing with remarkably bifurcated detached vein to radius, bifurcation sometimes long, its anterior branch environing the distal end of radius, sometimes almost reaching the anterior margin of wing; radius reaching the middle of detached vein; proximal media half as long as distal media; a single vannal vein almost as long as cubitus; jugal vein very slender, long.

Legs stout, tarsi 4-segmented; hind femur rhomboid, twice as long as broad; hind coxa trapezoidal.

Female and triungulin. Unknown.

Host. Unknown.

TYPE MATERIAL: Holotype male (Type No. 2154, Kyushu Univ.), July 21, 1977, and 3 paratopotype males, July 19, September 17 and 20, 1977, respectively, collected at light by Chantanee Hengsawad in the San Pa Tong Rice Experiment Station, Thailand.

TYPE DEPOSITORY: Holotype and 1 paratopotype male are preserved in the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka. Two paratopotype males are deposited in the San Pa Tong Rice Experiment Station, Thailand.

REMARKS: The present new species is closely allied to *M. furcatus* Bohart, 1951, from Philippines, but differs from it by the detached vein to radius being more closely situated to the wing margin, the slenderer hind femur, and the more sharply protruded dorsal process of the aedeagus.

A key to the world species of *Myrmecolax*, based on the males, is given below. We recognize 18 species including the present new species. We excluded *Caerocolax trinidadensis* Giinther, 1949, which was transferred to *Myrmecolax* by Kinzelbach in 1971, because we are not very certain whether the combination made by him is correct or not so far as we refer to his description. We also excluded *Myrmecolax parvus* Fox, 1967 because it seems to belong to *Lychnocolax* Bohart since it possesses the vein 2A which is a remarkable character for the latter genus.

KEY TO THE WORLD SPECIES (MALES) OF *Myrmecolax*

1. Hindwing with barely distinguishable single detached vein between radius and media; proximal media about one-fourth as long as distal media; length of body 1.7 mm. Liberia **M. blickenstaffi** Fox, 1967
- Hindwing with two detached veins between radius and media; proximal media longer than one-fourth of distal media 2
2. Distal end of detached vein to radius clearly bifurcated, anterior branch of bifurcation often directed to wing base so as to environ distal end of radius 3
- Distal end of detached vein to radius not bifurcated, or very slightly bifurcated, anterior branch of bifurcation very short 8
3. Flabellum of 3rd antennal segment reaching middle of 7th 4
- Flabellum of 3rd antennal segment shorter 6
4. Dorsal process of aedeagus short, not conspicuous; distance between internal margins of both eyes as long as diameter of globular eyes. Philippines **M. furcatus** Bohart, 1951
- Dorsal process of aedeagus long, almost as long as ventral projection 5
5. Ventral projection and body of aedeagus crossing by acute angle; distance between internal margins of both eyes one-third as long as diameter of globular eyes; length of body 2 mm. New Guinea **M. odontognathus** Kogan et Oliveira, 1964
- Ventral projection and body of aedeagus crossing by almost right angle; distance between internal margins of both eyes as long as diameter of globular eyes; length of body 2.44-2.55 mm. Thailand **M. chantaneeae** new species
6. Flabellum of 3rd antennal segment reaching at most basal third of 7th; length of body 1.75 mm. Indonesia **M. flagellatus** (de Meijere, 1908)
- Flabellum of 3rd antennal segment reaching base of 7th 7
7. Aedeagus with pointed dorsal process; length of body 1.65 mm. Argentine ... **M. borgmeieri** Hofeneder, 1949
- Aedeagus without dorsal process; length of body 1.3-2.5 mm. Zaire, Angola, Liberia and Ghana **M. leleupi** Pasteels, 1956 (= *M. mano* Fox, 1967)
8. Flabellum of 3rd antennal segment reaching at least middle of 7th 9
- Flabellum of 3rd antennal segment reaching at most base of 7th 11
9. Aedeagus without dorsal process. Sri Lanka **M. nietneri** Westwood, 1858

- Aedeagus with prominent dorsal process10..
- 10. Distal segment of maxilla about 6 times as long as broad, apex rounded;
length of body 2.2 mm. Philippines**M. rossi** Bohart, 1951
- Distal segment of maxilla about 10 times as long as broad, apex pointed;
length of body 1.6 mm. New Guinea**M. longipalpis** Kogan et Oliveira, 1964
- 11. Seventh antennal segment as long as or slightly longer than 6th12
- Seventh antennal segment clearly longer than 6th14..
- 12. Postscutellum short, slightly longer than broad; length of body 2 mm. Philip-
pines**M. philippinensis** Bohart, 1941
- Postscutellum long, about 1.5 times as long as broad13
- 13. Flabellum of 3rd antennal segment reaching a little beyond base of 7th; ae-
deagus curved near base, with clearly pointed dorsal process; detached vein
to radius minutely bifurcated. Philippines**M. culionensis** Bohart, 1951
- Flabellum of 3rd antennal segment reaching middle of 6th; aedeagus almost
straight, without dorsal process ; detached vein to radius not bifurcated. Bra-
zil **M. incautus** Oliveira et Kogan, 1959
- 14. Scutellum very small, nearly half as broad as postlumbium*..... 15
- Scutellum as broad as postlumbium16
- 15. Flabellum of 3rd antennal segment and 5th broader than 7th; length of body
1.4-2.4 mm. Zaire, Angola, Nigeria, Ghana, Guinea, and probably Liberia ...
.....**M. congoensis** Silvestri, 1939
 (= *M. lundensis* Luna de Carvalho, 1959)
 (= *M. pseudolundensis* Luna de Carvalho, 1959)
 (= *M. afurcifer* Luna de Carvalho, 1959)
 (? = *Afrostylops lunai* Fox et Fox, 1964)
- Flabellum of 3rd antennal segment and 5th as broad as 7th; length of body
2.5 mm. Madagascar**M. vadoni** Paulian, 1959
- 16. Aedeagus slender, nearly parallel-sided or slightly tapering; tip of prescutum
reaching beyond anterior margins of scuti; length of body 1.4 mm. Liberia
.....**M. liberiensis** Fox, 1967
- Proximal third of aedeagus broad, distal two-thirds tapering17
- 17. Distal half of aedeagus strongly curved dorsally in lateral view ; tip of prescu-
turn not beyond anterior margins of scuti; hind femur with broadened apex;
length of body 1.4 mm. Liberia**M. kpelle** Fox, 1967
- Aedeagus almost straight in lateral view; tip of prescutum beyond anterior
margins of scuti; hind femur slender, not expanded apically; length of body
2.2 mm. Nigeria**M. longipes** Luna de Carvalho, 1972

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